Atomos Connect

Connect S2H & H2S User Guide

Congratulations on purchasing your Connect converter and Test Pattern Generator. You are now the proud owner of an extremely compact and versatile converter that can run standalone for up to 10 hours from the battery supplied – no AC cables required! Of course, as is our custom at Atomos, we have included a comprehensive selection of accessories, including a 9V AC power adaptor, AC battery charger and a 12V DC travel adaptor too.

The Connect is designed to be convenient and stackable, with a battery shoe and foot top and bottom. Power can be passed through the Connect converter to supply power to other devices such as recorders monitors and lighting. In fact, you can power or mount onto any device with a Sony compatible L-mount battery.

The built-in Test Pattern Generator has multiple patterns, in both SD and HD, the latter including 1080p50 and 60 – true 3G modes. The modes are indicated by coloured LEDs, which are explained in this QuickStart Guide. Learn the colour sequences, learn the modes for fast and easy operation.

What's in the box

CONNECT H2S

HDMI→HD-SDI

(Part No. ATOMH2S001)

- ☐ Connect H2S
- ☐ 9V AC Adaptor
- ☐ 12V DC Travel Adaptor
- ☐ NP Series Battery
- ☐ AC Battery Charger

HDMI IN

2 x HD-SDI OUT/TPG OUT

CONNECT S2H

HD-SDI→HDMI

(Part No. ATOMS2H001)

- ☐ Connect S2H
- ☐ 9V AC Adaptor
- ☐ 12V DC Travel Adaptor
- ☐ NP Series Battery
- ☐ AC Battery Charger

HDMI OUT/TPG OUT

LOOP OUT/TPG OUT HD-SDI IN

NOTE:

This User Guide pertains to both Connect units. Each Connect box contains 1 converter only.

Unit description

1. POWER/BATTERY
2. MODE
3. USB port (Firmware updates only)
4. HDMI port (H2S in / S2H out)
5. LED DISPLAY
6. SDI CONNECTOR
7. BATTERY TOP
8. BATTERY SHOE

LED INDICATOR OVERVIEW

There are 4 modes of operation indicated by LEDs.

MODE	LED COLOUR
CONVERTER MODE (ext. bat.)	
(int. bat)	
TPG MODE	
PRECISE BATTERY LEVEL	
FLASHLIGHT MODE	

LED LABELS

PDR Pulldown Removal
TPG Test Pattern Generator
Rx Conversion Input Status

TPG→ (TEST PATTERN MODE)
M Mode
P/I Progressive/Interlaced
R Rate
S Scan

Getting started

CHARGING BATTERIES

We recommend that you charge new batteries before using them.

To charge the **external battery** supplied, place onto the supplied charger and charge until the light turns from RED to GREEN.

To charge the **internal battery**, place the supplied AC mains adaptor OR an external battery on to the Connect. Full internal battery charge is indicated by 4 BLUE LEDs after pressing the **PWR/BAT** button.

NOTE: The battery level indicated by pressing the **PWR/BAT** button will always be the current active battery. If an external battery or AC mains power supply is attached, the external battery/AC mains level will be indicated when **PWR/BAT** is pressed. If no external battery is present, the internal battery level will be indicated when **PWR/BAT** is pressed.

POWER UP

Turn on by pressing the **PWR/BAT** button and the unit will power up ready for operation.

Turn off by pressing & holding **PWR/BAT** button for more than 3 seconds.

NOTE: Connect Converters utilise the aluminium side panels to dissipate heat. Do not be alarmed if the sides of the product are warm or hot to touch, this is deliberate and normal heat dissipation operation.

Power management

EXTERNAL & INTERNAL BATTERIES

The Connect converter has an internal battery (240mAh) that will last up to 1 hour in normal Converter mode. Also included, and recommended for normal operation, is an NP-570 (2600mAh) Sony-compatible battery and an AC (110-240v) mains power adaptor. The following describes the power management indicators displayed on the Connect while using the internal, external and AC power supplies.

BASIC BATTERY INDICATOR

This indicates which power source is in use (internal or external) and when power has been reduced to critical levels. This is a basic indicator that can be used to instantly check which battery is in use and if a replacement battery is required.

EXTERNAL

INTERNAL

External battery or AC power indication

A BLUE LED indicates the use of an external battery. This will flash BLUE when the external battery is low.

NOTE: The internal battery will charge when an external battery or AC mains adaptor is attached to the Connect.

EXTERNAL BATTERY

EXTERNAL BATTERY LOW

NOW USING INTERNAL BATTERY

Internal battery level indication

GREEN indicates the internal battery is in use

This will go to solid RED when under 50% power remaining.

When the internal battery is critically low, the LED will show flashing RED.

INTERNAL BATTERY

INTERNAL BATTERY LOW <50%

CRITICAL → CHANGE BATTERY

Power management

DETAILED BATTERY LEVEL INDICATION

In order to more accurately check the level of the battery currently in use (internal or external), press the **PWR/BAT** button while in any mode.

The status level will be indicated for a few seconds and then return to the previous mode of operation.

BATTERY LEVEL INDICATOR	
● ● ● ●	**Full**
● ● ● ●	**7/8**
● ● ● ○	**6/8**
● ● ● ○	**5/8**
● ● ○ ○	**4/8**
● ● ○ ○	**3/8**
● ○ ○ ○	**2/8**
● ○ ○ ○	**1/8**
● ○ ○ ○	**Empty**

NOTE: The internal battery will recharge whenever an external battery or AC mains adaptor is connected.

CONTINUOUS POWER

A portable device without a power supply is useless, but that will never happen with Connect converters.

With flexible battery and power options, you're covered for any eventuality – even an unexpected power loss. A built-in battery ensures that the show goes on if all else fails.

Multiple, stackable external batteries can be swapped without powering down, and any Connect battery configuration acts as a backup to AC power, at the same time as being charged from it.

POWERING OTHER DEVICES

Connect converters securely mount to and power any device with a compatible NP series battery (L-Mount).

You can mount to, and power recorders (Ninja, Ninja-2 and Samurai), monitors and lighting all while converting!

Operation

MODES OF OPERATION

The Connect converter has two modes of operation: **Converter** and **Test Pattern Generator (TPG)**. To switch between them, press and hold the **MODE** button for more than 2 seconds. A mode change will be indicated by the TPG LED illuminating GREEN for TPG Mode and the Rx LED illuminating RED or GREEN for Converter Mode.

NOTE: Connect S2H converts SDI to HDMI and Connect H2S converts HDMI to SDI when in Converter Mode.

Converter Mode

The Rx LED indicates when an input signal has been locked and is being converted. See the Pull-Down Removal (PDR) section for PDR during conversion. Connect supports 16, 20 & 24-bit audio in all modes of conversion.

A GREEN Rx LED indicates a locked video signal is being converted.

A RED Rx signal indicates searching for a signal for conversion.

Supported formats

Connect S2H: HD-SDI→HDMI

1080p60	1080psf30
1080p59.94	1080psf29.97
1080p50	1080psf25
1080i60	1080psf24
1080i59.94	1080psf23.98
1080i50	720p60
1080p30	720p59.94
1080p29.97	720p50
1080p25	486i59.94
1080p24	480i59.94
1080p23.98	576i50

Connect H2S: HDMI→HD-SDI

1080p60	1080psf30
1080p59.94	1080psf29.97
1080p50	1080psf25
1080i60	1080psf24
1080i59.94	1080psf23.98
1080i50	720p60
1080p30	720p59.94
1080p29.97	720p50
1080p25	486i59.94
1080p24	480i59.94
1080p23.98	576i50

Operation

Pulldown Removal (PDR)

Many video cameras, although recording internally in 23.98p, 24p, 25p, 29.97p & 30p output the video signal over SDI or HDMI in interlaced (psf). The internal recording format is converted to an interlaced (psf) format in order to be compatible with more monitors and displays. This process is called applying Pulldown (Telecine) to the video stream. The Connect converter can remove this Pulldown (reverse Telecine) from the incoming signal and convert the interlaced formats back to their original form 23.98p, 24p, 25p, 29.97p and 30p.

When the Connect is in Converter Mode and locked (Rx) to an interlaced signal (1080i) that has had Pulldown applied, the Pulldown (PDR) function can be used.

2:2 Pulldown Removal Operation

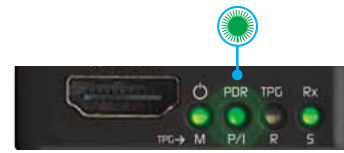
To activate the 2:2 pulldown function, press the **MODE** button once. The PDR LED will turn BLUE.

The unit will then convert as follows:

INPUT		OUTPUT
23.98psf	→	**23.98p**
24psf	→	**24p**
25psf	→	**25p**
29.psf	→	**29.97p**
30psf	→	**30p**

3:2 Pulldown Removal Operation

To activate the 3:2 pulldown function press the **MODE** button a second time. The PDR LED will flash GREEN, indicating it is searching for a 24p sequence to lock to.



3:2 Pulldown converts signals containing 23.98/24p video inside a 59.94/60i stream respectively.

IMPORTANT! 3:2 Pullldown removal must be calculated from a moving sequence of video. To aid obtaining 3:2 Pulldown lock, move the camera or wave your hand in front it.

3:2 Pulldown Lock

3:2 Pulldown Lock is indicated by a solid GREEN LED. When illuminated GREEN, the original 23.98/24p sequence will be output, the unit is converting 59.94/60i back to the original 23.98/24p source.

INPUT		OUTPUT
59.94i	→	**23.98p**
60i	→	**24p**

NOTE: If the input signal is not interlaced, the PDR function is disabled.

Pressing the **MODE** button a third time turns off the pulldown.

Operation

Test Pattern Generation Mode

A major part of video engineering is signal testing and verification. The Connect is also a convenient portable test solution for these tasks. With four built-in test patterns and SD, HD as well as 3G video modes supported, you can test your equipment in a cost effective, professional way. When in Test Pattern Generation (TPG) Mode, both the video mode and the test pattern output can be changed.

Using TPG

TPG Mode is entered by pressing and holding the **MODE** button for more than 2 seconds.

This mode will be indicated by a GREEN LED on the TPG indicator.

This is the TPG Home state. To return to Converter Mode, press the **MODE** button again for more than 2 seconds.

TPG Mode ON (Home)

After TPG Mode has been activated, pressing the **MODE** button at any time will utilise all four LEDs to indicate the current video output mode, as per the following indicators.

NOTE: The TPG video mode indication will last for 4 seconds before returning to TPG Home page.

TPG Video Mode Indication

The TPG colour code indicators for the TPG video modes are **M, PI, R** and **S.** These correspond to the following video formats:

MODE – indicates video resolution

●	RED = under 1080 Resolution – (486i59.94, 576i50, 720p59.94, 720p50)
●	GREEN = Standard 1920x1080 formats (23.98p, 24p, 25p, 29.97p, i50, i59.94)
●	BLUE = 3G 1920x1080 formats (p50, p59.94)

P/I – indicates Progressive or Interlaced video formats

●	GREEN = Progressive
○	No Light = Interlaced

RATE – indicates the video clock rate/region

●	GREEN = NTSC frame rates (23.98, 29.97, 59.94 Hz)
●	BLUE = PAL Frame Rates (24, 25, 50 Hz)

SCAN – indicates scan rates

●	GREEN = film scan rates (23.98, 24 Hz)
○	No Light = television rates (29.97, 59.94, 25, 50 Hz)

NOTE:

Connect H2S outputs TPG on both SDI outputs.

Connect S2H outputs on both the HDMI and the LOOP OUT SDI outputs TPG.

Operation

Changing the TPG Video Mode

While the Connect is indicating the TPG video mode (as above), the video output mode can be changed by pressing the **MODE** button a second time.

Each subsequent press of the **MODE** button while in this state will cause the Connect to scroll through video modes in the following order.

TPG	MODE	P/I	RATE	SCAN
NTSC	●	○	●	○
720 59	●	●	●	○
1080i 59	●	○	●	○
p29	●	●	●	○
p59	●	●	●	○
p23	●	●	●	●
p24	●	●	●	●
PAL	●	○	●	○
720 50	●	●	●	○
1080i 50	●	○	●	○
p25	●	●	●	○
p50	●	●	●	○

NOTE: You must first enter the TPG Video Indication mode in order to change the current TPG video output format.

Changing the Test Pattern Output

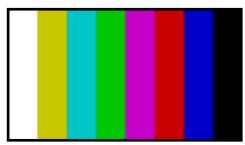
While the Connect is indicating the TPG video mode, the type of test pattern output can be changed by pressing the **PWR/BAT** button.

Each subsequent press of the **PWR/BAT** button while in this state will cause the Connect to scroll through the 4 test patterns available in the following order:

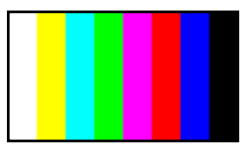
1. SMPTE Colour Bars 75%

2. SDI EQ/PLL Pathological

3. Colour Bars 75%



4. Colour Bars 100%



NOTE: To change the test pattern in use, you must first be in TPG Mode, have activated the TPG Video Format Indicator and while in this mode press the **PWR/BAT** button.

To return back to Converter Mode, press and hold the **MODE** button for more than 2 seconds.

Operation

Time Code Pass-Through

TIMECODE PASS-THROUGH

Connect converters are designed to convert everything from one standard to another, this includes timecode (TC) and record start/stop trigger flags (S/S). SDI TC will be converted to HDMI TC on S2H and HDMI TC will be converted to SDI TC on H2S. This allows perfect translation of all parts of the video standards between HDMI and SDI. Connect converters support Sony, Canon, Panasonic, JVC, Arri and RED SDI TC and S/S. In HDMI they support Canon and Sony TC and Canon's S/S, currently the only HDMI TC and S/S protocols available.

Flashlight function

The Connect also has a handy flashlight function that will illuminate all LEDs WHITE.

To activate the flashlight, press both the **MODE** & **PWR/BAT** button at the same time. This mode can be activated in any mode of operation.

To turn the flashlight off, press either button, **MODE** or **PWR/BAT.**

Firmware updating

The firmware of the Connect series converters can be updated via the USB mini port. Detailed instructions on how to update your converter can be found at:

www.atomos.com/support

Technical specifications

Connect H2S/S2H

Dimensions	45.0mm (w) x 76.5mm (l) x 30.0mm (h)	
Power Consumption	2W while converting	
Batteries (NP Series, 7.4V - 16.8V)	• Internal up to 1 hour • 2600mAh - 10hrs (included) • 5200mAh - 20hrs (optional) • 7800mAh - 30hrs (optional) • AC Power Supply 100-240V (included) • DTap Adaptor (optional)	
Continuous Power (Patent Pending)	Connect acts as a battery, feeding continuous power into your LED light or monitor, Ninja, Samurai, or another Connect.	
Built-in 3:2 and 2:2 Pulldown Removal	• 25PsF (50i)→25P • 30PsF (60i) →30P • 24p (3:2-60i) →24P	
Test Pattern Generator	SMPTE 75%, Colour Bars 75 & 100%, SDI EQ/PLL Pathological, Audio Tone 1kHz @ -20dBfs	
USB Interface	Firmware Update Interface ONLY	
Video Input	**H2S:** HDMI x 1	**S2H:** 3G/HD/SD-SDI x 1
Video Out	**H2S:** 3G/HD/SD-SDI x 2	**S2H:** 3G/HD/SD-SDI x 1 and HDMI x 1
Audio (In/Out)	Embedded Audio 2ch, 24, 20 or 16-bit	
Timecode	**SDI:** Sony, Canon, Panasonic, Arri, RED **HDMI:** Sony, Canon Timecode, Canon Start/Stop	
Supported Formats (In/Out)	1080p60, 1080p59.94, 1080p50, 1080i60, 1080i59.94, 1080i50, 1080p30, 1080p29.97,1080p25, 1080p24, 1080p23.98, 1080psf30, 1080psf29.97, 1080psf25, 1080psf24,1080psf23.98, 720p60, 720p59.94, 720p50, 486i59.94, 480i59.94, 576i50	

All specifications are subject to change without notice.

Warranty & Conditions

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International Hardware Limited Warranty (1 Year Standard/2 Years If Registered)

Atomos warrants that:

- the main product will be free from defects in materials and workmanship for a period of 1 year from the date of purchase or 2 years upon completion of product registration at www.atomos.com
- the battery and battery charger will be free from defects in materials and workmanship for a period of 6 months from the date of purchase regardless of registration.

This warranty is exclusively for the benefit of the original purchaser and is not assignable or transferable.

If during the warranty period the product is shown to be defective Atomos may at its option:

a) replace the goods or supply equivalent ones;
b) repair the goods;
c) pay the cost of replacing the goods or of acquiring equivalent ones; d) pay the cost of having the goods repaired;

The customer must notify Atomos of any defect in the goods in writing prior to the expiry of the warranty periods set out above. The customer will be solely responsible for returning the goods to Atomos or its authorized distributor. Upon acceptance of a warranty claim by Atomos, where Atomos repairs or replaces the goods, it will be responsible for reasonable shipping costs incurred in sending the goods to the Customer, provided that customer is located in a country in which Atomos has an authorized distributor or repair centre or agent.

Warranty Exclusions

This warranty applies only to defects in workmanship and does not cover defects caused by:

- Failure to comply with the current operating instructions issued by Atomos
- Neglect
- Improper or negligent acts or omissions
- Unauthorised repairs or attempted repairs
- Tampering with, or modification of the goods
- Connection to incompatible equipment or power sources
- Exposure to water or weather
- Exposure to magnetic fields or corrosive liquids or substances

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